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Citation for published version:
Saunders, DH, Sanderson, M, Hayes, S, Johnson, L, Kramer, S, Carter, D, Jarvis, H, Brazzelli, M & Mead, G 2020, 'Physical fitness training for stroke patients', *Stroke*, vol. 51, no. 11, pp. e299-e300. https://doi.org/10.1161/STROKEAHA.120.030826

Digital Object Identifier (DOI):
10.1161/STROKEAHA.120.030826

Link:
Link to publication record in Edinburgh Research Explorer

Document Version:
Peer reviewed version

Published In:
Stroke

Publisher Rights Statement:
This is a non-final version of an article published in final form in Saunders, DH, Sanderson, M, Hayes, S, Johnson, L, Kramer, S, Carter, DD, Jarvis, H, Brazzelli, M, Mead, GE. Physical fitness training for stroke patients. Cochrane Database of Syst Rev. 2020;3:CD003316. doi: 10.1002/14651858.CD003316.pub7.

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Download date: 07. May. 2023

PHYSICAL FITNESS TRAINING FOR STROKE PATIENTS

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Cardiorespiratory and musculoskeletal fitness are low following a stroke. Interventions to improve physical fitness after stroke could have a range of physical, cognitive and psychosocial benefits.

OBJECTIVES

The primary objectives of this updated review (1) were to determine whether fitness training after stroke reduces death, death or dependence, and disability. The secondary objectives were to determine the effects of training on adverse events, risk factors, physical fitness, mobility, physical function, health status and quality of life, mood, and cognitive function.

METHODS

SEARCH METHODS

We searched (July 2018) the Cochrane Stroke Group Trials Register, the Cochrane Central Register of Controlled Trials (CENTRAL 2018, Issue 1), MEDLINE (from 1966), EMBASE (from 1980), CINAHL (from 1982), SPORTDiscus (from 1949), and PsycInfo (from 1806). We also searched ongoing trials registers, hand-searched relevant journals and conference proceedings, screened reference lists, and contacted experts.

SELECTION CRITERIA

Randomised trials comparing either cardiorespiratory training or resistance training, or both (mixed training), with usual care, no intervention, or a non-exercise intervention in stroke survivors.

DATA COLLECTION AND ANALYSIS

Two review authors independently selected studies, assessed risk of bias, and extracted data. We analysed data using random-effects meta-analyses and assessed the quality of the evidence using the GRADE approach.

RESULTS

We included 75 studies, involving 3017 mostly ambulatory participants, which assessed cardiorespiratory (32 studies, 1631 participants), resistance (20 studies, 779 participants), and mixed training interventions (23 studies, 1207 participants).

There were few deaths with no between group differences (risk differences 0.00 low-certainty). Composite death or dependence data were not reported.

Disability scores were improved by cardiorespiratory training (standardised mean difference (SMD) 0.52, 95% CI 0.19 to 0.84; P=0.002; moderate-certainty) and mixed training (SMD 0.23, 95% CI 0.03 to 0.42; P=0.02; low-certainty) at the end of the intervention. There were too few data to assess the effects of resistance training.

There were multiple physical benefits to cardiorespiratory and musculoskeletal fitness, walking speed and balance. These tended to be intervention-specific with low or moderate certainty evidence. Risk factor data were limited or showed no effects apart from a favourable increase in cardiorespiratory fitness ($\dot{V}O_2$ peak; mean difference (MD) 3.40 mL/kg/min, 95% CI 2.98 to 3.83; moderate-certainty) after cardiorespiratory training. There was no evidence of serious adverse events and a lack of data for mood, quality of life, and cognition. Benefits beyond the training period were unclear although some mobility benefits were retained. Risk of bias varied across studies but imbalanced amounts of exposure in control and intervention groups was a common issue affecting many comparisons.

REVIEWER CONCLUSIONS

Few deaths overall suggest exercise is a safe intervention but means we cannot determine whether exercise reduces mortality or the risk of death or dependency. Cardiorespiratory training and, to a lesser extent mixed training, reduces disability during or after usual stroke care. There is sufficient evidence to incorporate cardiorespiratory and mixed training, involving walking, within post-stroke rehabilitation programmes to improve fitness, balance and walking speed. Further well-designed randomised trials are needed to determine the optimal exercise prescription, the range of benefits and any long-term benefits.

Keywords; Stroke, physical exercise, systematic review, physical fitness, disability

Word count not including title = 500

Disclosures

DH Saunders was a co-author of one included study (Mead 2007).

GE Mead received grants from Chief Scientist Office during the conduct of the study; and occasionally receives royalties from Later Life Training for producing a teaching course for exercise professionals; the Cochrane review underpins the course. These royalties are used to support further research. GE Mead has led a study of exercise after stroke that is included in the review (Mead 2007).

M Sanderson, S Hayes, L Johnson, S Kramer, D Carter, H Jarvis and M Brazzelli have no declarations of interest.

Funding Sources

None

Acknowledgement

This paper is based on a Cochrane Review published in The Cochrane Library 2020, Issue 3 (see www.thecochranelibrary.com for information). Cochrane Reviews are regularly updated as new

evidence emerges and in response to feedback, and The Cochrane Library should be consulted for the most recent version of the review.

Reference

1) Saunders DH, Sanderson M, Hayes S, Johnson L, Kramer S, Carter DD, Jarvis H, Brazzelli M, Mead GE. Physical fitness training for stroke patients. Cochrane Database of Systematic Reviews 2020, Issue 3. Art. No.: CD003316. DOI: 10.1002/14651858.CD003316.pub7.

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